



Ozone modifies associations between temperature and cardiovascular mortality: Analysis of the NMMAPS data

Author(s): Ren C, Williams GM, Morawska L, Mengersen K, Tong S
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Abstract:

OBJECTIVES: Both ambient ozone and temperature are associated with human health. However, few data are available on whether ozone modifies temperature effects. This study aims to explore whether ozone modified associations between maximum temperature and cardiovascular mortality in the USA. **METHODS:** The authors obtained data from the US National Morbidity, Mortality, and Air Pollution Study (NMMAPS) website. They used two time-series Poisson regression models (a response surface model and a stratification model) to examine whether ozone modified associations between maximum temperature and cardiovascular mortality (CVM) in 95 large US communities during 1987-2000 in summer (June to September). Bayesian meta-analysis was used to pool estimates in each community. **RESULTS:** The response surface model was used to examine the joint effects of temperature and ozone on CVM in summer. Results indicate that ozone positively modified the temperature-CVM associations across the different regions. The stratification model quantified the temperature-CVM associations across different levels of ozone. Results show that in general the higher the ozone concentration, the stronger the temperature-CVM associations across the communities. A 10 degrees C increase in temperature on the same day was associated with an increase in CVM by 1.17% and 8.31% for the lowest and highest level of ozone concentrations in all communities, respectively. **CONCLUSION:** Ozone modified temperature effects in different regions in the USA. It is important to evaluate the modifying role of ozone when estimating temperature-related health impacts and to further investigate the reasons behind the regional variability and mechanism for the interaction between temperature and ozone.

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Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Air Pollution, Temperature, Other Exposure

Air Pollution: Interaction with Temperature, Ozone

Temperature: Fluctuations

Other Exposure: dew point

Geographic Feature:

Climate Change and Human Health Literature Portal

resource focuses on specific type of geography

Urban

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Cardiovascular Effect

Cardiovascular Effect: Other Cardiovascular Effect

Cardiovascular Disease (other): cardiovascular disease mortality

Resource Type:

format or standard characteristic of resource

Research Article

Timescale:

time period studied

Time Scale Unspecified